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EXAMINER	
ORTIZ RODRIGUEZ, CARLOS R	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/039,425	Applicant(s) MARSHALL ET AL.	
	Examiner Carlos Ortiz-Rodriguez	Art Unit 2125	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 05 December 2005.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-30 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-30 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The Examiner of record in this application has been changed. The indicated allowability of claims 1-30 is withdrawn in view newly cited references. Please note that some claims might have multiple rejections based on the newly cited references.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-30 rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Specifically, independent claims 1, 9, 11, 19, 21 and 29 recite the limitation "performing a path finding process through the node graph", this limitation renders the claims indefinite because it is ambiguous whether it is referring to the "original node graph" or to the "modified node graph".

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-2, 4-12, 14-22 and 24-30 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 1, 11, 19, 21 and 29 are directed to a process. The steps of modifying a node graph and performing a path finding process to

determine the node path steps amount to a judicial exception (i.e. an abstract idea). In looking for a practical application, there is no physical transformation. Further, determining a generic node path (without the animation sequence disclosed) does not provide a useful and tangible result since no real world use is recited. Further, even if the claim could be said to provide a practical application, claim 1 covers, and thus preempts, every use of the judicial exception. Thus, claim 1 does not appear to recite patent-eligible subject matter. Claim 2, 4-8, 10, 12, 14-18, 20, 22, 24-28 and 30 do not recite any limitation which would overcome the deficiencies of claims 1, 9, 11, 19, 21 and 29 above.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 11 are rejected under 35 U.S.C. 102 (b) as being anticipated by "Advogato's Trust Metric", www.advogato.org, 2000.

Regarding claims 1 and 11, "Advogato's Trust Metric", discloses determining a node path through a node graph, comprising: modifying the node graph (see section titled "Conversion into single source, single sink) in accordance with a metric (capacity); and performing a path finding process (Ford-Fulkerson algorithm) through the node graph to determine the node path (see section titled "Computation of network flow).

8. Claims 1-30 are rejected under 35 U.S.C. 102 (b) as being anticipated by Lake et al., "Stylized Rendering Techniques for scalable real-time 3D animation", University of North Carolina at Chapel Hill, 2000.

Regarding claims 1, 11 and 21, Lake et al. disclose a method of determining a node path through a node graph, comprising: modifying the node graph (Section 7, L8, removing from or adding vertices to a 3D mesh) in accordance with a metric (Section 7, L1-3, in accordance with requirements of a processor, graphics accelerator, and drivers); and performing a path finding process (Section 7, L3, NPR techniques integrated with MRM) through the node graph to determine the node path (Section 7, L9, changing the level of detail of the mesh). *It should be noted that "a path finding process" is being interpreted as a process for finding a new interconnection of nodes, basically generating a new node graph with a different resolution/level of detail. Lake et al. does this using the nonphotorealistic rendering (NPR) technique integrated with the multiresolution mesh (MRM) system.*

Regarding claims 2, 12 and 22, Lake et al. discloses wherein the node graph comprises a three-dimensional mesh (Section 7, L8); and modifying the node graph comprises changing a number of polygons that make up the three-dimensional mesh (Section 7, L8, removing from or adding vertices implicitly discloses changing a number of polygons).

Regarding claims 3, 13 and 23, Lake et al. discloses wherein the metric comprises maintaining a steady frame rate for an animation sequence that includes the node graph (Section

7, L4 and L11-12, constant frame rate).

Regarding claims 4, 14 and 24, Lake et al. discloses wherein a platform runs an animation sequence that includes the node graph (Section 7, L7); the method further comprising: detecting a change in performance of the platform; and adjusting the node graph in accordance with the change in performance of the platform (Table 1).

Regarding claims 5, 15 and 25, Lake et al. discloses, wherein the node graph is adjusted to compensate for the change in performance of the platform (Table 1).

Regarding claims 6, 16 and 26, Lake et al. discloses wherein, if a predetermined node of the node graph is removed during adjusting, the method further comprises: re-locating the predetermined node on the node graph; and performing the path finding process using the re-located predetermined node (Section 7, L7, performing NPR techniques on a range of low- to high-end platforms. *It should be noted that nodes are relocated according to the level of the platform.*).

Regarding claims 7-8, 17-18 and 27-28, Lake et al. discloses, wherein the node graph comprises a three-dimensional mesh and re-locating comprises: obtaining a position on the three-dimensional mesh that corresponds to the predetermined node; and assigning the predetermined node to a polygon in the three-dimensional mesh that is closest to the position (Section 3.3,

subdividing a polygon by interpolating along each edge to find a new, temporary vertices).

Regarding claims 9, 19 and 29, Lake et al., discloses a method of determining a node path through a node graph, comprising: modifying the node graph (Section 7, L8, removing from or adding vertices to a 3D mesh) in accordance with a predetermined platform performance (Section 7, L1-3, in accordance with requirements of a processor, graphics accelerator, and drivers); performing a path finding process (Section 7, L3, NPR techniques integrated with MRM) through the node graph to obtain the node path (Section 7, L9, changing the level of detail of the mesh); determining if the platform performance has changed; adjusting the node graph to compensate for a change in the platform performance (Table 1); and re-performing the path finding process through the adjusted node graph to obtain the node path (Table 1, rendering on each class of machine (faces/vertices)). *It should be noted that "a path finding process" is being interpreted as a process for finding a new interconnection of nodes, basically generating a new node graph with a different resolution/level of detail. Lake et al. does this using the nonphotorealistic rendering (NPR) technique integrated with the multiresolution mesh (MRM) system.*

Regarding claims 10, 20 and 30, Lake et al., discloses wherein, if a predetermined node of the node graph is removed during adjusting, the method further comprises: re-locating the predetermined node on the node graph; and performing the path finding process using the re-located predetermined node (Section 7, L7, performing NPR techniques on a range of low- to high-end platforms. *It should be noted that nodes are relocated according to the level of the platform.*).

9. Claims 1, 2, 3, 11, 12 , 13, 21, 22 and 23 are rejected under 35 U.S.C. 102 (b) as being anticipated by Bandi et al., "Path finding for human motion in virtual environments", Elsevier Science 2000.

Regarding claims 1, 11 and 21, Bandi et al. discloses determining a node path through a node graph, comprising: modifying the node graph (Page 105 Section 3 L1-2, Page 105 Section 3 L16-18) in accordance with a metric (Page 104 Section 2 L12-18, in accordance with real-time application requirements); and performing a path finding process through the node graph to determine the node path (Page 105 Section 3.1 L6-7).

Regarding claims 2, 12 and 22, Bandi et al. discloses wherein: the node graph comprises a three-dimensional mesh (Page 104-105 Section 2 Paragraph 3); and modifying the node graph comprises changing a number of polygons that make up the three-dimensional mesh (Page 105 Section 3 L1-2, Page 105 Section 3 L16-18).

Regarding claims 3,13 and 23 Bandi et al. discloses wherein the metric comprises maintaining a steady frame rate for an animation sequence (see Abstract , video games/ architectural walk-throughs) that includes the node graph (environment map). *It should be noted that Bandi et al.'s proposed algorithm works for complex 3D environments suitable for real-time video games that require a steady frame rate considering both physical dimensions of the human and actions such as jumping, bending, etc.*

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 4-8, 14-18 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bandi et al., "Path finding for human motion in virtual environments", Elsevier Science 2000 in view of Migdal et al. U.S. Patent No. 6,262,739.

Regarding claims 4, 5, 14, 15, 24, 25 Bandi et al. discloses all the limitations of the base claims. Furthermore, Bandi et al. discloses wherein a platform runs an animation sequence that includes the node graph (Abstract- algorithms for complex 3D environments suitable for video games and architectural walk-throughs).

But Bandi et al. fails to clearly specify detecting a change in performance of the platform; and adjusting the node graph in accordance and/or to compensate with the change in performance of the platform.

However, Migdal et al. disclose detecting a change in performance of the platform; and adjusting the node graph in accordance and/or to compensate with the change in performance of the platform (see Abstract and C6 L25-L43).

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the algorithm disclosed by Bandi et al. with the adjusting of node graphs in accordance with the performance of a platform disclosed by Migdal et al.

One of ordinary skill in the art would have been motivated to do this modification in order to increase processing time as suggested by Migdal et al. (C4 L19-28).

Regarding claims 6,16 and 26 the combination of Bandi et al. and Migdal et al. disclose all the limitations of the base claims as outlined above.

Furthermore, Bandi et al. in combination with Migdal et al. disclose, wherein, if a predetermined node of the node graph is removed during adjusting (see Bandi et al., Figure 6, 4-neighbor movement and 8-neighbor movement), the method further comprises: re-locating the predetermined node on the node graph; and performing the path finding process using the re-located predetermined node (see Bandi et al., Figure 6, DDA movement).

Regarding claims 7,17, 27 the combination of Bandi et al. and Migdal et al. disclose all the limitations of the base claims as outlined above.

Furthermore, Bandi et al. in combination with Migdal et al. disclose, wherein the node graph comprises a three-dimensional mesh and re-locating comprises: obtaining a position on the three-dimensional mesh that corresponds to the predetermined node; and assigning the predetermined node to a polygon in the three-dimensional mesh that is closest to the position (see Bandi et al., Figure 6). *It should be noted that although Figure 6 is related to 2D mesh, the same concept is applicable to 3D mesh (Page 116 Section 116 L1-2 and Page 106 Section 3.2 Paragraph 1).*

Regarding claims 8,18 and 28 the combination of Bandi et al. and Migdal et al. disclose all the limitations of the base claims as outlined above.

Furthermore, Bandi et al. in combination with Migdal et al. disclose, wherein the node graph comprises a three-dimensional mesh and re-locating comprises: obtaining a current position of the path finding process on the three-dimensional mesh; and assigning the predetermined node in accordance with the current position (see Bandi et al., Figure 6). *It should be noted that although Figure 6 is related to 2D mesh, the same concept is applicable to 3D mesh (Page 116 Section 116 L1-2 and Page 106 Section 3.2 Paragraph 1).*

12. Claims 9-10, 19-20 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bandi et al., "Path finding for human motion in virtual environments", Elsevier Science 2000 in view of Migdal et al. U.S. Patent No. 6,262,739.

Regarding claims 9, 19 and 29 Bandi et al. discloses performing a path finding process through the node graph to obtain the node path (Page 105 Section 3.1 L6-7); adjusting the node

graph (Page 105 Section 3 L1-2, Page 105 Section 3 L16-18) and re-performing the path finding process through the adjusted node graph to obtain the node path (Figure 6, DDA movement).

But Bandi et al. fails to clearly specify determining if the platform performance has changed and adjusting the node graph in accordance with a change in performance of the platform and/or to compensate for the change in performance of the platform.

However, Migdal et al. disclose determining if the platform performance has changed and adjusting the node graph in accordance with a change in performance of the platform and/or to compensate for the change in performance of the platform (see Abstract and C6 L25 L43).

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the algorithm disclosed by Bandi et al. with the adjusting of node graphs in accordance with the performance of a platform disclosed by Migdal et al.

One of ordinary skill in the art would have been motivated to do this modification in order to increase processing time as suggested by Migdal et al. (C4 L19-28).

Regarding claims 10, 20 and 30 the combination of Bandi et al. and Migdal et al. disclose all the limitations of the base claims as outlined above..

Furthermore, Bandi et al. in combination with Migdal et al. disclose, wherein, if a predetermined node of the node graph is removed during adjusting, the method further comprises: re-locating the predetermined node on the node graph; and performing the path finding process using the re-located predetermined node (see Bandi et al., Figure 6, DDA movement).

Citation of Pertinent Prior Art

13. The following prior art made of record is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to determining a node path through a node graph:

a. U.S. Patent No. 6,262,737 to Li et al., which discloses 3D mesh compression and coding.

b. U.S. Patent No. 6,970,171 to Baraff et al., which discloses global intersection analysis for determining intersections of objects in computer animation.

c. U.S. Patent No. 7,050,904 to Powell et al., which discloses data formats and usage for massive point-to-point route calculation.

d. U.S. Patent No. 5,999,189 to Kajiya et al., which discloses image compression to reduce pixel and texture memory requirements in a real-time image generator.

e. U.S. Patent No. 6,292,194 to Powell, III, which discloses image compression method to reduce pixel and texture memory requirements in graphics applications.

f. U.S. Patent No. 6,573,890 to Lengyel, which discloses compression of animated geometry using geometric transform coding.

The following publications are cited to further show the state of the art with respect to determining a node path through a node graph:

g. Popovic, Jovan et al., “Progressive Simplicial Complexes”, Microsoft Research.

h. Lonzano-Perez et al., “An Algorithm for Planning Collision-Free Paths Among Polyhedral Obstacles”, ACM, 1979.

i. Hoppe, Hughes, “Progressive Meshes”, Microsoft Research, ACM 1996.

j. Thalmann et al., “Computer Animation in Future Technologies”, University of Geneva, 1996.

k. Egbert et al., “Collision-Free Object Movement Using Vector Fields”, Brigham Young University, 1996.

l. Garland et al., “Surface simplification using quadratic error metrics”, IEEE, 1997.

m. Garcia-Luna-Aceves, “A Path-Finding Algorithm for Loop-Free Routing”, IEEE, 1997.

n. Hoppe, Hugues, “Smooth View-Dependent Level-of-Detail Control and its Application to Terrain Rendering”, IEEE Visualization, 1998.

o. Bandi et al., “Space discretization for efficient human navigation”, Swiss Federal Institute of Technology, 1998.

p. Bandi et al., “The use of space discretization for autonomous virtual humans”, Swiss Federal Institute of Technology, 1998.

q. Leung et al., “Interactive viewing of 3D terrain models using VRML”, Syracuse University, 1998.

r. To et al., “A method for Progressive and Selective Transmission of Multi-Resolution Models”, ACM 1999.

s. Lake et al., “Stylized Rendering Techniques For Scalable Real-Time 3D Animation”, 2000.

t. Ware et al., “Layout for Visualizing Large Software Structures in 3D”, University of New Brunswick, 2000.

u. Brockington, Mark, "Pawn Captures Wyvern: How Computer Chess Can Improve Your Pathfinding", Gama Network, 2000.

v. Frohlich et al., "Autonomous and Robust Navigation for Simulated Humanoid Characters in Virtual Environments", IEEE, 2002.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Ortiz-Rodriguez **(new examiner of record)** whose telephone number is **571-272-3766.**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Carlos Ortiz-Rodriguez
Patent Examiner
Art Unit 2125

July 24, 2007

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